

6 ALBERT TERRACE, LONDON NW1 7SU

NOISE IMPACT ASSESSMENT

Report 12039-NIA-01-RevC

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Issued For:

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12039-SP1	Indicative Site Plan
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1.0 INTRODUCTION

Clement Acoustics has been commissioned by Humphrey Kelsey Architecture to measure existing background noise levels at 6 Albert Terrace. The measured noise levels have been used to determine noise emission criteria for a proposed plant installation in agreement with the planning requirements of the Local Authority.

This report presents the results of the environmental survey followed by noise impact calculations and outlines any necessary mitigation measures.

2.0 SITE DESCRIPTION

6 Albert Terrace is one of 6 semi-detached villas. The property is located on the corner of Regent's Park Terrace and Albert Terrace. As part of currently proposed works, a plant installation is proposed.

Current proposals are to install:

- 2 No. new condensing units, (replacing two smaller existing units)
- 1 No. air handling unit (AHU)
- 1 No. heat recovery unit (HRU)

The condenser units will replace two existing condenser units, in the same position located externally, to the rear of the property at lower ground floor level. The AHU and HRU are to be installed in an internal plant area at lower ground floor level and will discharge to the rear of the property.

The rear windows of a property on Albert Terrace Mews has been identified as the nearest affected receiver. Locations are shown in attached site plan 12039-SP1.

3.0 ENVIRONMENTAL NOISE SURVEY

3.1 Procedure

Measurements were undertaken at one position as shown on indicative site drawing 12039-SP1. The choice of this position was based both on accessibility and on collecting representative noise data in relation to the site.

The microphone was attached to a tree approximately 2 metres from ground level at the front of the building. The position was considered to be free-field, and a correction for reflections has therefore not been applied. Noise levels at Position 1 were dominated by road traffic during the installation and collection of equipment.

Continuous automated monitoring was undertaken for the duration of the survey between 13:00 on 1 March 2017 and 10:00 on 3 March 2017.

Weather conditions were generally dry with light winds, therefore suitable for the measurement of environmental noise.

The measurement procedure generally complied with BS 7445:1991: *'Description and measurement of environmental noise, Part 2- Acquisition of data pertinent to land use'*.

3.2 Equipment

The equipment calibration was verified before and after use and no abnormalities were observed.

The equipment used was as follows.

- 1 No. Svantek Type 957 Class 1 Sound Level Meter
- Norsonic Type 1251 Class 1 Calibrator

4.0 RESULTS

The $L_{Aeq:5min}$, $L_{Amax:5min}$, $L_{A10:5min}$ and $L_{A90:5min}$ acoustic parameters were measured at the location shown in site drawing 12039-SP1.

The measured noise levels are shown as a time history in Figure 12039-TH1, with background noise levels summarised in Table 4.1.

	Minimum background noise level $L_{A90:5min}$ dB(A)
Daytime (07:00 - 23:00)	53 dB(A)
Night-time (23:00 - 07:00)	41 dB(A)

Table 4.1: Minimum background noise levels

5.0 NOISE CRITERIA

The *London Borough of Camden* criteria for plant noise emissions are understood to be as follows:

“The ‘A’ weighted sound pressure level from the plant, when operating at its noisiest, shall not at any time exceed a value of 10dB below the minimum external background noise, at a point 1 metre outside any window of any residential property.”

It is understood that the proposed plant may operate over a 24 hour period. We therefore propose to set the noise criteria at **31 dB(A)**, the value 10dB below the minimum measured background noise level during the survey.

6.0 DISCUSSION

6.1 Proposed Installation

The proposed plant installation comprises the following:

- 2 No. Daikin Mini VRV Condenser Units – RXYSCQ
- 1 No. AHU – Heatstar Phoenix EC
- 1 No. HRU – Systemair TOPVEX TX/C04 EL-R

Noise emissions for the proposed plant units, as provided by the manufacturer, are shown in Tables 6.1 and 6.2. Loudest modes of operation have been used in order to present a robust worst case assessment.

Unit	Sound Pressure Level at 1 m in each Frequency Band							
	63Hz	125Hz	250Hz	500Hz	1kHz	2kHz	4kHz	8kHz
Daikin Mini VRV Condenser Units – RXYSCQ	68	70	70	68	65	56	50	45

Table 6.1: Manufacturer Noise Emissions Levels – Condenser

Unit	Sound Power Levels in each Frequency Band							
	63Hz	125Hz	250Hz	500Hz	1kHz	2kHz	4kHz	8kHz
AHU – Heatstar Phoenix EC - Extract	48	56	62	65	62	63	60	51
AHU – Heatstar Phoenix EC - Supply	46	52	58	61	58	58	56	47
HRU – Systemair TOPVEX TX/C04 EL-R - Extract	25	42	55	62	64	61	55	55
HRU – Systemair TOPVEX TX/C04 EL-R - Supply	31	42	43	44	44	40	34	31

Table 6.2: Manufacturer Noise Emissions Levels – AHU & HRU

The proposed plant locations are at the rear of the property at lower ground floor level and are shown on indicative site plan 12039-SP1.

The condenser units will be located externally, while the AHU and HRU will be located in a plant room, with ventilation provided via louvred panels.

The closest receiver has been identified as the windows on the rear facade of a residential property on Albert Terrace Mews which is a minimum of 10 m from the proposed plant location.

6.2 Proposed Mitigation Measures

In order to meet the proposed criteria stated in Section 5.0, it is recommended that an enclosure is installed around the Daikin condenser units. Noise mitigation measures should not be required for the AHU or HRU units.

The condenser enclosure should provide sufficient attenuation to achieve a maximum sound pressure level of 49dB(A) when measured at 1 m in all directions.

Based on the information provided, an enclosure meeting the sound reduction indices as stated in Table 6.2 should be suitable to achieve this.

Mitigation	Required Attenuation (dB) in each Frequency Band							
	63Hz	125Hz	250Hz	500Hz	1kHz	2kHz	4kHz	8kHz
Louvred Enclosure	-5	-5	-6	-11	-19	-21	-17	-15

Table 6.2: Required Attenuation from Mitigation

6.3 Noise Impact Assessment

Taking into account all necessary acoustic corrections, the resulting noise level at the identified residential windows would be as shown in Table 6.3. Detailed calculations are shown in Appendix B.

Receiver	Criterion	Noise Level at Receiver (due to proposed plant)
Nearest Residential Property	31 dB(A)	30 dB(A)

Table 6.3: Noise levels and criteria at noise sensitive receivers

As presented in Table 6.3 and Appendix B, the proposed plant installation with acoustic enclosure would be expected to meet the requirements of the proposed criteria.

6.4 British Standard Requirements

Further calculations have been undertaken to assess whether the noise emissions from the proposed plant unit would be expected to meet recognised British Standard recommendations, in order to further ensure the amenity of nearby noise sensitive receivers.

British Standard 8233:2014 '*Guidance on sound insulation and noise reduction for buildings*' gives recommendations for acceptable internal noise levels in residential properties. Assuming worst case conditions, of the closest window being for a bedroom, BS 8233:2014 recommends 30dB(A) as being acceptable internal resting/sleeping conditions during night-time.

With loudest external levels of 30dB(A), acceptable internal conditions would be met when taking the attenuation of the window into consideration. According to BS 8233:2014, a typical building facade with a partially open window offers 15 dB attenuation.

It can therefore be predicted that, in addition to meeting the requirements of the set criteria, the emissions from the proposed plant would be expected to meet the most stringent recommendations of the relevant British Standard, with neighbouring windows partially open. Predicted levels are shown in Table 6.4.

Receiver	Design Range – <i>For resting/sleeping conditions in a bedroom, in BS8233:2014</i>	Noise Level at Receiver (due to plant installation)
Inside Residential Window	30 dB(A)	15 dB(A)

Table 6.4: Noise levels and criteria inside nearest residential space

7.0 CONCLUSION

An environmental noise survey has been undertaken at 6 Albert Terrace. The results of the survey have enabled criteria to be set for noise emissions from the proposed plant units in accordance with the requirements of the Local Authority.

A noise impact assessment has then been undertaken using manufacturer noise data to predict the noise levels, due to the proposed plant, at the nearby noise sensitive receivers.

Calculations show that noise emissions from the proposed plant units should meet the requirements of the Local Authority with the recommended mitigation installed as stated herein.

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